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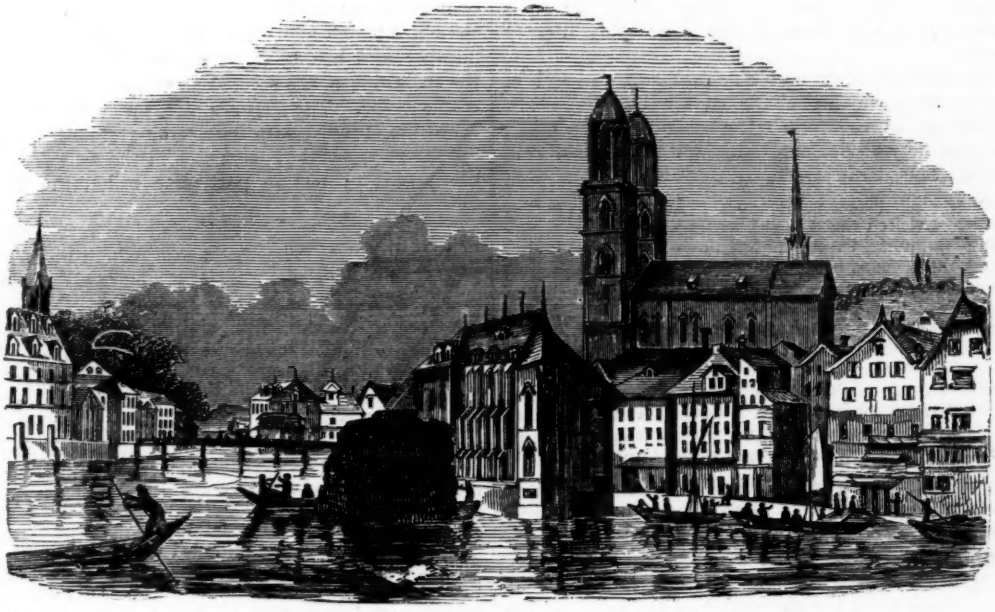
ZURICH, IN SWITZERLAND.



ZURICH

ZURICH is the name of a town, and of a lake on the borders of which it is situated, in Switzerland, as also of the Canton which contains both the town and the lake.

The *Canton* of Zurich is at the north-west part of Switzerland, and adjoins the Duchy of Baden: it contains about a thousand square miles, and a quarter of a million inhabitants. Its surface presents a pleasant alternation of hill and valley; but not many of those magnificent scenes which distinguish many parts of Switzerland. The climate is mild, and the soil fertile and well cultivated. Rich pastures and extensive orchards abound, together with fine tracts of wooded country. Corn, wine, cattle, butter, cheese, cotton, silk, linen, woollen, and leather, are the chief products, agricultural and manufacturing. The inhabitants are of German origin, and, with the exception of two societies, are Calvinists. The Government was formerly a mixture of the aristocratic and the democratic; but it was remodelled in 1831, by which the legislative power was vested in a council of two hundred and twelve members, twenty five of whom formed an executive council, and court of final appeal. Large estates are sometimes to be bought; but smaller ones very rarely, because every one in possession of a few acres of land, hopes some day or other to build a house upon his property. A tenth of the produce is claimed by the government in the form of taxes. In this Canton, as well as in some others in Switzerland, every individual is obliged by law to insure his house; the sum paid for which is, however, very trifling,—ten shillings for one thousand pounds.

The *Lake* of Zurich is one of the most picturesque and beautiful in Switzerland. It extends, in the form of a crescent, chiefly through the Canton of Zurich, but partly also between those of Schweitz and St. Gall. It is divided into two parts by the Strait of Rapperswyl, a quarter of a mile over, crossed by a bridge: in other places the breadth varies to nearly five miles; and the length is about thirty. The lake is surrounded by a populous and well cultivated country, and the prospects on its banks are richly varied. Behind and above the hills which enclose it, loftier summits rise gradually higher and higher, till the eye finally rests on the glaciers of Glarus, Schweitz, and the Grisons. The lake, for several hundred yards from its banks, is seldom more than from six to twelve feet deep: it teems with fish, which, owing to the extreme clearness of the water, are seen in all their number and variety. The Lake of Zurich has been termed the Winandermere of Switzerland.

The *town* of Zurich is one of the most important in Switzerland. It is situated on the river Limmat, at the north extremity of the lake, and in a narrow valley between hills; its distance from Constance being 36 miles, and from Berne 55. Its situation is exceedingly pleasing, although the houses of the town itself are old-fashioned. Few places of the size of Zurich, and of its limited population (14,000), have surpassed it in the cultivation of literature. For five centuries it has been a town of literary distinction, and has numbered among its natives the names of Conrad Gesner, Solomon Gesner (the author of the *Death of Abel*), John James Gesner, Lavater, Hirzel, and Pestalozzi. The city library contains as many as seventy thousand volumes, as well as portraits of all the chief magistrates of the place,

Among other public buildings in the place are, a school for deaf and dumb, a school for the blind, a society of physics, economics, and natural history, a military school, a medical seminary, &c. The tower of Wellenberg is situated in the middle of the river Limmat, and is used as a felons' prison: in former times it enclosed within its walls, the Count Hans de Habsbourgh, the Count of Rapperschwyl, and many other important state prisoners. There is an academy of artists; an academy of music; a society called the Swiss Society of Public Utility; and several schools for teaching languages. There are two newspapers published in Zurich, one appearing weekly, the other twice a week; and there is also a monthly literary journal.

Almost every town and city has some record of by-gone days which is cherished by the inhabitants, and shown to visitors as the "lion" of the place. One such lion at Zurich is the bow of William Tell. A recent tourist says:—

Among other places pointed out to strangers as worthy of notice, I visited the Arsenal, where one may receive a lesson of humility, in attempting to wield the swords, and to carry the armour, borne by the warriors of other days. I of course handled the bow said to be the bow of William Tell; and the identical arrow that pierced the apple is also shown. I cannot conceive of what materials the sinews of that distinguished patriot were made; for the degenerate men of our time are obliged to use a machine, with the power of the lever, to draw the cord even half way to the point at which the arrow is discharged. There is a vast collection of ancient armour preserved, and modern equipments for more than all the able-bodied men in the Canton.

In the cultivation of their land, the inhabitants of Zurich are spoken of in high terms by travellers. It is impossible to look at their fields, gardens, hedges, trees, flowers, or domestic vegetables without perceiving proofs of the extreme care and industry that are bestowed upon the cultivation of the soil. If, for example, a path leads through or by the side of a field of grain, the corn is not, as in England, permitted to hang over the path, exposed to be pulled up or trodden down by every passer by: it is everywhere bounded by a fence; stakes are placed at intervals of about a yard, and boughs of trees are passed longitudinally between them. In the gardens, which around Zurich are extremely large, the most punctilious care is evinced in every production that grows. The vegetables are planted with great accuracy; and neither weeds nor stones are to be seen among them. Plants are not earthed up, as with us, but are planted in a small hollow, into each of which a little manure is put, and each plant is watered daily. Where seeds are sown, the earth directly above is broken into the finest powder. Every shrub, every flower, is tied to a stake, and where there is wall fruit, a trellice is erected against the wall, to which the boughs are fastened.

Zurich is an exceedingly industrious place. The field labourer frequently works from four in the morning till eight in the evening; and the townspeople also seem to care very little about amusements; for there is neither theatre, public concerts, nor balls: indeed dancing, from what certainly appears an ultra solicitude for the preservation of morals, is not permitted in any part of the Canton, unless by special permission of the government; and this is almost always refused. In order that the pleasure of a dance may be enjoyed without incurring certain penalties, a given number of persons must subscribe a paper declaratory of their intentions. This is handed to the council; and it is for them to decide whether or no it shall be granted; but it is said that a refusal is generally the result. But although there is little of what we call public amusement, there is a good deal of visiting among the inhabitants; consisting either of dinner parties, to which relations only are invited, and which take place at stated times in each other's houses; or else of *soirées*, which have, however, a different character from similar meetings in France and England, for while there is tea and talk for the ladies, there is tobacco and talk for the gentlemen, as the two sexes do not mingle together on such occasions.

One favourite pursuit of the Zurichers is, after having earned a fortune by industry, to build a country-house on the borders of the lake. Most of the villas which adorn the lake, and which exceed in number and beauty those surrounding any other of the Swiss lakes, are erected as pleasure-houses by the townspeople. The suburbs also, on every side of the town, are studded with handsome residences. There are many pleasant promenades in the neighbourhood of the town; one in particular called the walk of Gesner.

The language spoken at Zurich is a very imperfect patois, but good German is everywhere understood; and the French and English languages also form part of a good education. It is melancholy, however to readers accustomed to the simple rites of the English Church, to think that such a beautiful spot should be the abode of superstition. There is, in the Canton of Schweitz, to the south of that of Zurich, a place called *Einsiedeln*, to which pilgrimages are made every year by the Roman Catholic inhabitants of Switzerland. Mr. Inglis, in his journey through Switzerland, thus speaks of the first sight that met his eye on entering Zurich:—

The quay of Zurich was crowded with a host of miserable looking beings, whose dress and aspect at once distinguished them from the inhabitants of the canton. They were mostly women; their hats were of bright yellow straw; their garments, a union of rags; a scrip, with seemingly scanty provision, hung over the shoulder of each; and in the hand of each was a rosary. Several boats were preparing to receive them; and they were soon, to the number of at least a hundred, disposed in the different boats, and were immediately rowed down the lake. These were pilgrims,—poor misguided, deceived pilgrims,—who were on their way to the church of our Lady, at Einsiedeln, in the canton of Schweitz, to pay their adoration to a miraculous image of the Virgin, and to receive absolution. They had, many of them, come from distant parts of France, Germany, and even Belgium. They had left home and friends, and what to them were doubtless comforts, to journey upon foot some hundreds of miles, and to spend upon this pilgrimage the saving of years. Those nave a heavy account to answer, who have aided the delusion of these miserable devotees.

Again, the same writer observes:—

Scarcely a day passed while I resided at the lake-side, upon which one or more boats were not seen filled with pilgrims on their way to Einsiedeln. A monstrous muttering of prayer came over the water, according ill with the smiling scenery around, and the glorious sunshine that lighted them on their way, and in strange and disagreeable contrast with the Swiss echo-song which had just arisen from a boat freighted with light hearts, and with the notes of a sweet pipe floating from the opposite shore. Boats laden with pilgrims passed from, as well as to, Einsiedeln; but the laugh and the jest, instead of the prayer, were heard among them; for they had bowed at the shrine of our lady, and had no more occasion for prayer!

It may not be out of place briefly to state the nature of this pilgrim-place.

A church situated at the small village of Einsiedeln is said, by a bull published by Pope Leo VIII., to have been consecrated by God himself. The Bishop of Constance, in the year 948, was about to consecrate a chapel to the Virgin Mary, when he suddenly heard angels in the air chanting the very same prayer which

is chanted when bishops are accustomed to consecrate churches. The bishop thereupon refused to consecrate the chapel, at which the people were enraged, and while they were expostulating with him they heard a clear voice saying, "Cease, my brethren, it is divinely consecrated!" at which all the people marvelled, and were convinced. Such is the legend promulgated by those in authority; after which, "who can be surprised," as Mr. Inglis remarks, "that the credulous and ignorant should need little incitement to make a pilgrimage to Einsiedeln?" One thing is certain, that the convent and church at Einsiedeln are most magnificent, contrasting strangely with the mean hamlet in which they are situated. The convent is of the Benedictine order, with about fifty resident friars. The sleeping rooms of the brethren are comfortable, and simply fitted up with two chairs and a mattrass on a bedstead; but the eating room is large and magnificent.

The church of the convent is gorgeously decorated with gilding, paintings, marble, &c.; there being not a foot of either walls or roof without some kind of adornment. But the great attraction of the church, that to which the devotees direct their wandering steps, is the Holy chapel, containing the miraculous image of the Virgin. The chapel is of black and gray marble, and stands within the church; and in a niche in this chapel, erected for the purpose, is deposited the image; and at all hours of the day, from the earliest dawn till deep twilight, hundreds may at all times be seen prostrated before the iron gate, through which the devotee may catch a glimpse of the object of his pilgrimage. While Mr. Inglis was in the town, he saw a procession of the pilgrims. Preceded by banners, and the other emblems of the Romish church, and by all the inmates of the abbey, among whom appeared two friars of the order of Capuchins, with hair-shirts and sandals, were seen all the pilgrims then congregated at Einsiedeln. The men walked first two and two, and the women followed, the number of the whole being upwards of 8000. After the procession had made a considerable circuit, it entered the church, where a discourse was preached by one of the Capuchins.

The number of pilgrims who visited Einsiedeln are stated to have been, in 1817, 114,000; in 1821, 124,000; in 1822, 132,000; in 1824, 150,000; in 1825, 162,000; in 1828, 176,000. The revenues of the abbey are said to be very large; for, independently of the sums paid for masses, besides contributions of other kinds, they receive a large accession from the benedictions bestowed upon rosaries, crosses, and images. Thousands and tens of thousands of these are bought by the pilgrims, and are carried to the abbé, who, for the kiss bestowed upon each, receives one, two or more francs, according to the means of the possessor. Many of the pilgrims are the representatives of others, who, for various reasons, may not be able to attend in person at the shrine, and who therefore placed their offerings in the hands of their neighbours. Mr. Inglis, in another part of Switzerland, met with a woman whose reputation for sanctity was so great, that she had obtained the appointment of representative at the shrine of the Virgin at Einsiedeln, for all the wealthy people in the commune in which she lived; she made four pilgrimages every year on their account.

In the square in front of the abbey booths are erected on every side, with shops full of a gaudy display of trinkets, rosaries, books, crucifixes, prints of saints, popes, martyrs, images of the Virgin, and other emblems of the Romish church. These were all purchased in large numbers by the pilgrims.

We cannot conclude this paper without expressing regret that so beautiful and luxuriant a land should be the scene of such mis-applied zeal, and mis-spent time and money.

WILL-O'-THE-WISP.

I HAD the pleasure of seeing that remarkable and interesting phenomenon called *ignis fatuus* or *Will-o'-the-Wisp*, on the night of the 31st of December 1839, in two meadows and a stubble field, about a mile from Powick Village, near the Upton road. I had for several nights before been on the look out there for it, but was told by the inhabitants of the house that previously to that night it was too cold. I noticed it from one of the upper windows intermittingly for about half-an-hour, between ten and eleven o'clock, at the distance of from one to two hundred yards off me. Sometimes it was only like a flash in the pan on the ground; at other times it rose up several feet and fell to the earth, and became extinguished; and many times it proceeded horizontally from fifty to one hundred yards with an undulating motion, like the flight of the laughing woodpecker, and about as rapid; and once or twice it proceeded with considerable rapidity in a straight line upon or close to the ground.

The light of these *ignes fatui* was very clear and strong, much bluer than that of a candle, and very like that of an electric spark, and three or four of them looked larger and as bright as the star Sirius; of course they look dim when seen in ground fogs, but there was not any fog on the night in question; there was however a muddy closeness in the atmosphere, and at the same time a considerable breeze from the south-west. Those *Will-o'-the-wisps* which shot horizontally invariably proceeded before the wind towards the north-east.

On the day before, namely, the 30th of Dec., there was a white frost in the morning; but as the sun rose behind a mantle of very red and beautifully stratified clouds, it rained heavily (as we anticipated) in the evening; and from this circumstance I judged that I should see the phenomenon in question on the next night, agreeably to all the evidence I had before collected upon that subject.

On the night of the 1st Jan. 1840, I saw only a few flashes on the ground at the same place; but on the next night (the wind still blowing from the south-west) I not only saw several *ignes fatui* rise up occasionally in the same locality many feet high, and fall again to the ground, but at about eight o'clock two very beautiful ones rose together a little more than one hundred yards from me, and about fifty yards apart from each other. The one ascended several yards high, and then fell to the ground in the shape of an arch and vanished. The other proceeded in an horizontal direction for about fifty yards towards the north-east, in the same undulating and rapid manner as I have before described. I and others immediately ran to the spot, but did not see any light during our stay there. Both these nights were starlight, with detached clouds, and, rather warm, but no fog. On the night of the 3rd Jan. the atmosphere was occasionally thick, but there was not any wind or fog, nor the slightest appearance of the phenomenon. I did not observe any lightning during the whole of these observations, which were made by others of the house as well as myself.

I am of opinion that these are electric meteors which rise in exhalations from out of the earth, particularly in the winter season, and that they occur principally if not entirely a day or two after considerable rain, and a change from a comparative cold to a comparative warm temperature.

[*Letter from* Mr. J. ALLIES, *in the Worcestershire Chronicle.*]

IT is very remarkable that two favourite and ingenious apologues prevailed among the heathen philosophers of antiquity, both of them having reference to the introduction of evil by the acquisition of knowledge, and which would seem to have been suggested to their inventors by the scriptural narrative at the fall of our first parents. The beautiful fable of the guilty curiosity and subsequent wanderings of Psyche, until her final reconciliation with her divine husband; and that of Prometheus, particularly as it is given in the terribly splendid drama of Æschylus; each of them clearly point to this important fact. If not actually derived from Scripture, they, at all events, show by their remarkable coincidence with one another, and with the Mosaic history, that the hypothesis to which they refer is a correct inference from the philosophy of morals.—SHUTTLEWORTH

THE HYDROSTATIC PRESS.

THERE are but few principles in Mechanical Philosophy which have led to more valuable applications in the manufacturing arts than that fundamental law of Hydrostatics known as *the equal pressure of liquids in every direction*. This at first sight may appear erroneous, as we know that if water be contained in an open cup or basin, it presses downwards on the bottom of the vessel, but does *not appear* to press upwards, and therefore that the pressure is *not* equal in every direction. But this difficulty will disappear, when we consider the question in a more general point of view.

A liquid holds a medium position between a solid and an air or gas. A solid is composed of particles clinging or cohering so closely together, that force of some kind is necessary to separate them. An air or gas, on the other hand, is composed of particles which have so little coherence, that in order to retain or keep them together, we must confine or press them: thus, if an ounce of air at the surface of the earth fill a certain bulk, it will fill a larger bulk when at an elevation above the earth, because it is less confined or pressed by superincumbent air when it is thus elevated. The atoms of air, in fact, repel one another. Water, and liquids generally, are formed of particles which have no repulsion, and scarcely any attraction, for one another, but they are free to move in every direction, by the slightest force. This is manifested in the simple act of putting the finger into a vessel of water: no difficulty exists in so doing; the particles of water, pressed by the finger, instantly yield, and diffuse themselves between and among the surrounding particles, leaving room for the finger. But here is developed a most important truth, which is indeed the foundation of the whole science,—that although the particles are perfectly free to move among themselves, they are for all common results *incompressible*, that is, a given quantity of water can scarcely be compressed into a smaller bulk. This power of resisting compression is so great that it required delicate experiments to determine whether water was not absolutely incompressible. Some experiments made by Mr. Perkins seemed to show, that when a small quantity of water was compressed by a power of thirteen hundred pounds, it was reduced $\frac{1}{2\frac{1}{7}}$th in bulk, that is, that that which before filled twenty-seven measures, now filled only twenty-six. But supposing the experiment to be correct, the compression is so very trifling, compared with the force employed, that it is scarcely incorrect, in common language, to call liquids incompressible.

Let us now see what results will follow from these two properties: first, that the particles of a fluid move freely among one another; second, that they are, taken collectively, almost incompressible. So long as a fluid is contained in an open vessel, no pressure is perceptible but that resulting from gravity, which tends to confine the fluid to the bottom of the vessel. No upward pressure whatever is perceptible. But let the vessel be completely filled and firmly closed, and a new power is then just beginning to show itself. Suppose we have a cubical vessel, measuring one foot in every direction, closed on all sides, but having a square tube, an inch in diameter, inserted in the top. The vessel may be filled with water, by pouring it down this tube, and so long as the quantity of water is just within one cubic foot, the vessel will not be completely filled: there will be a little empty space just beneath the cover. But when once the cubic foot of water has been poured in, and the vessel is quite full, we have the first beginning of a pressure which will show itself upwards and sideways, as well as downwards. On pouring a little more water down the tube, the pressure instantly commences. The vessel will hold $12\times12\times12=1721$ cubic inches of water, and no more, and if only one single inch above that quantity be poured down the tube it will remain in the tube. If we continue pouring water in the tube to the height of twelve inches, the refusal of the vessel to contain more than a given quantity still exists. We have not changed the quantity of water in the vessel, but have merely added to the height of that in the tube.

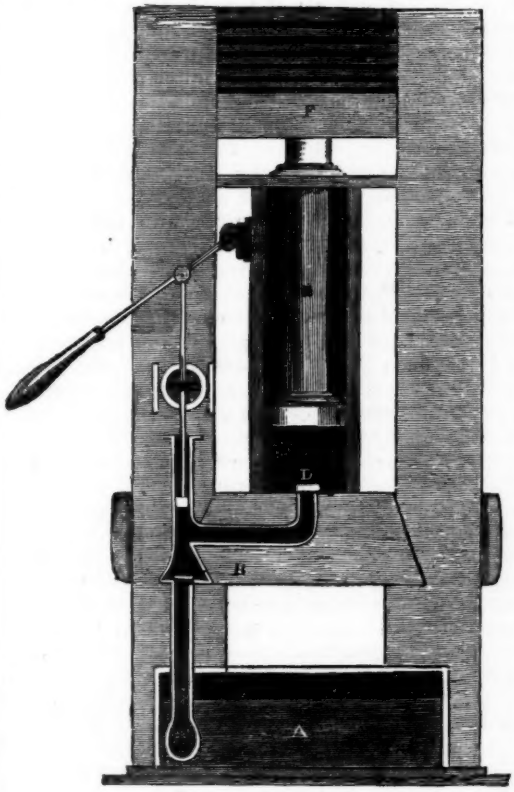
But let us mark what other power is meanwhile brought into action. Is the water in the vessel in the same condition as before the additional water was poured into the tube? Far from it: the *quantity* is the same, but every atom is as it were in a state of constraint. That particular part of the vessel where the tube is fixed, has twelve inches more height of water than any other part. What is the consequence? That the downward gravitating force is twice as much there as in any other part, and the lower particles of water have to bear the weight of those that are above them. But as the particles cannot be forced closer together, this additional pressure then directs itself *laterally*, because as the particles are free to move among one another, they cannot and do not remain at rest, if there happen to be a pressure greater on one side of them than on another. Thus the pressure gets communicated from particle to particle, until the whole body of water feels it: they all remain at the same mutual distances as before, but they all feel the effects of that pressure which the water in the tube makes in that of the vessel.

Now the *amount* of this pressure leads to some very curious results. The particles forming every square inch in any part of the liquid are pressed, and press in their turn, with the same force as the water in the tube presses on that directly beneath it; consequently the top and sides of the vessel are pressed in the same proportion; or, every square inch of the surface of the vessel experiences a bursting pressure, equal to the pressure of the water in the tube on that in the vessel. It is not difficult to determine what this pressure is; for the downward pressure of the water in the tube is but another name for the *weight* of it: the water is twelve inches high and one inch in diameter; and the amount is therefore twelve cubic inches, which weigh about seven ounces. Every square inch of the vessel, therefore, is pressed outwards by a force of seven ounces, equal to 63 lbs. on each of the six surfaces forming the cubical vessel, or 378 lbs. in the whole. We hence see that the pressure, when viewed in this light, is really very formidable; and it is one of those examples of the law, which have led to its being called the *Hydrostatic paradox*: seven inches of water produce a pressure of 378 lbs! But the term paradox is not properly applied here, since by tracing the operation of the law of equal pressure, we see how directly the effect just stated will follow from it:—equal pressure to equal surfaces does not seem paradoxical, and yet it is but another way of expressing the result to which we have arrived.

To trace all the effects of this important law on the equilibrium and pressure of liquids, would be to write a treatise on hydrostatics, since there is scarcely a fact in the whole science but what depends fundamentally on the principle of equal pressure. We shall, on the present occasion, only speak of the method by which this principle is made available for the same purposes as a common screw-press, but to a much greater extent, and in a far more convenient way

In the supposed case which we have detailed above, each side of the vessel was pressed with a force of

63 lbs.; the top was therefore pressed *upwards* with that force. Now if there could be any contrivance by which the top of the vessel would be moveable upwards, without letting out the water, and if there were sixty pounds weight placed on the top, it would still be forced up because the pressure from within is greater than that from without. Seven ounces of water in the tube would. therefore actually elevate 60 lbs. weight. But in order to produce a pressure powerful enough to be available for many processes in the arts, either the size of the vessel must be much increased, the diameter of the tube much diminished, or the water made to stand higher in the tube. All these methods have some defects, and it is therefore important to avail ourselves of the fact, that pressure of *any* kind, acting on a small surface of the water in the vessel, will be felt equally at all other parts; so that seven ounces pressure, effected by a piston or any other means, would be as available as the water in the tube. As the kind of pressure induced by a forcing pump is very great, we have thus an almost unlimited supply of power.



THE HYDROSTATIC PRESS.

The reader will now be in a condition to understand the action of a hydrostatic press, of which a cut is here given, representing a vertical section of the instrument. At A is a small cistern, or reservoir of water, into which dips the lower end of the pipe of a small forcing pump. This pipe may either have an open end, or, as in the figure, may have several small perforations, through which the water may flow from the cistern into the interior of the pipe. At the part of the pipe near B is a valve opening upwards, and above that is a continuation of the pipe, with a solid piston working vertically in it. This piston is connected by its rod with a handle, which is worked in the usual manner of a pump. A lateral tube springs from the part between the valve and the piston, and after bending upwards, terminates at the valve D. Above this is a hollow cylinder, with a solid piston working water-tight in it. This piston acts by the intervention of a shaft or pillar E, on a stout beam F, so that when the piston rises the beam or platform F rises also.

These being the positions of the several parts, the action is as follows. The water is at the same height in the pipe as in the cistern. But on raising the small piston, the air contained between the two valves and the piston becomes rarified: the valve at B opens in order that the air may equalize itself throughout the tube, and a little water rises in the tube. After a few strokes of the piston, the water has risen above the valve B, and fills the lateral pipe leading to D. The remarkable hydrostatic pressure now begins to show itself. On pressing down the piston again, the water cannot descend into the cistern, because the valve B opens only upwards: it therefore opens the valve D, and gets into the larger cylinder or pipe. A few more strokes of the piston brings the water in contact with the large piston in the cylinder: after this, every effort to press *down* the small piston operates in pressing *up* the larger one, and the amount of this upward pressure depends on the comparative dimensions of the two pistons. If the smaller one is one inch in diameter, and the larger six inches, it presents thirty-six times as much square surface, every inch of which is pressed upwards with the same force as the small piston is pressed downwards. Now, if the piston be pressed down with the force of 20 lbs., (an inconsiderable force with such a leverage as a pump handle affords,) the large piston will be pressed upwards with a force of $20 \times 36 = 720$ lbs.; so that if F were the lower board of a press, it would act on the body between it and the upper board with a force of 720 lbs.

When once the principle of a machine is well understood, improvements in the details may be expected. Mr. Bramah has availed himself of the beautiful hydrostatic law which we have been considering, to construct a press, the power of which is so extraordinary, that a mere statement of it, without explaining the principles on which it rests, would scarcely be credited. The small pipe of the forcing pump is frequently about half an inch in diameter, and of the cylinder twelve inches, so that a section of the large piston contains 576 times as large a surface as a section of the smaller cylinder. The pump is so strongly made, that a force of one ton may be applied to the handle, so that the small piston is pressed down with that force, and the larger piston is pressed up with a force of *five hundred and seventy-six tons.* We merely give this statement in figures, to show more clearly the power of the instrument. The actual power produced may be in any ratio we please,—limited only by the strength of the materials of which the press is made. We have seen a bar of iron cut through by a Bramah press not much exceeding a foot dimensions in each direction. In a future paper on *Bandana Handkerchiefs*, we shall have an opportunity of seeing one of the many instances of the valuable employment of the power produced by hydrostatic pressure.

THE sober stillness of the night
That fills the silent air,
And all that breathes along the shore,
Invite to solemn prayer.

Vouchsafe to me that spirit, Lord!
Which points the sacred way;
And let thy creatures here below
Instruct me how to pray.—CRABBE.

ON SKATING.

No season is so inclement but what it affords amusement to some: the same frost which checks the exercises of the swimmer and the rower, enables the skater and the slider to enjoy an hour's healthful exercise. This subject is not so trifling but that it may deserve a slight degree of notice from us.

The opportunities for indulging in amusements on the ice are obviously dependant on the climate of the country which we inhabit: hence the northern nations of Europe are more familiar with sliding and skating than the southern. The extremely cold and rugged districts of Norway, Lapland, and Sweden, are so frequently covered with enormous masses of snow, that ice-skating, such as we recognise it, is but little practised; in such cases, the snow-skates (described in *Sat. Mag.*, vol. viii., p. 9,) are employed. But in Holland, there is a sufficient amount of smooth ice, and a sufficient absence of snow, to enable the inhabitants to enjoy a considerable amount of skating every winter. Women join in it as well as men, and frequently skate to market, with their baskets on their heads. It is said, that, in 1808, two young women at Groningen won the prize in a skating match, going thirty miles in two hours.

It is not known at what period skating was first practised in England; but there are indications of its existence in the thirteenth century, for Fitzstephen, in his *History of London*, says that it was at that time customary, when the ice was sufficiently strong, for the young citizens of London to fasten the leg-bones of animals under the soles of their feet by tying them round their ancles, and then taking a pole shod with iron into their hands they pushed themselves forward by striking it against the ice, and moved with a celerity equal, as Fitzstephen says, "to a bird flying through the air, or an arrow from a cross-bow:" this statement we must of course sober down a little. He then proceeds to say:—"At times, two of them, thus furnished, agree to start opposite one to another at a great distance.—They meet, elevate their poles, attack, and strike each other, when one or both of them fall, and not without some bodily hurt; and even after their fall are carried a great distance from each other by the rapidity of the motion, and whatever part of the head comes upon the ice it is sure to be laid bare." This must evidently have been rather a violent kind of sport, and bore but a small relation to modern skating. Fitzstephen describes another kind of diversion on the ice, in these words:—"Others make a seat of ice as large as a millstone, and having placed one of their companions upon it, they draw him along, when it sometimes happens, that, moving on slippery places, they all fall down headlong." Strutt mentions that, in his time, it was customary to use sledges, which being extended from a centre by means of a strong rope, those who are seated in them are moved round with great velocity, and form a large circle.

The use of the modern skate is supposed to have been brought from Holland; and for many years skating has been exercised with much elegance in England and Scotland. Formerly the "skating club" of Edinburgh was considered to display the most elegant specimens of skating in the country; but since the establishment of a similar club in London, it is probable that the southern metropolis equals the northern in this matter.

In order to convey to our readers some idea of the *method* by which the art of skating may be acquired, we will give the substance of a description which a member of the Edinburgh club furnished to an early edition of the *Encyclopædia Britannica*.

Those who wish to be proficients in skating should begin at an early period of life, and should first endeavour to throw off the fear which always attends the commencement of an apparently hazardous amusement. They will soon acquire a facility of moving on the inside edge of their skates: when they have done this, they must endeavour to acquire the movement on the outside; which is nothing more than throwing themselves upon the outer edge of the skate, and making the balance of their body tend towards that side, which will necessarily enable them to form a semi-circle. In this, much assistance may be derived from placing a bag of lead-shot in the pocket next to the foot employed in making the outside stroke, which will produce an artificial poise of the body, afterwards very useful. At the commencement of the outside stroke, the knee of the employed leg should be a little bent, and gradually brought to a rectilineal position when the stroke is completed. When the practitioner becomes expert in forming the semicircle with both feet, he is then to join them together, and proceed progressively and alternately with both feet, which will carry him forward with a graceful movement. Care should be taken to use very little muscular exertion, for the impelling motion should proceed from the mechanical impulse of the body thrown into such a position as to regulate the stroke. At taking the outside stroke, the body ought to be thrown forward easily, the unemployed leg kept in a direct line with the body, and the face and eyes directly looking forward; the unemployed foot ought to be stretched towards the ice, with the toes in a direct line with the leg. In the time of making the curve, the body must be gradually, and almost imperceptibly raised, and the unemployed leg brought in the same manner forward; so that, at finishing the curve, the body will bend a small degree backward, and the unemployed foot will be about two inches before the other, ready to embrace the ice and form a correspondent curve. The muscular movement of the whole body must correspond with the movement of the skate, and should be regulated so as to be almost imperceptible to the spectators.

Mr. Walker, in his *Manly Exercises*, gives some very useful instruction concerning the choice and use of skates. The wood of the skate should be slightly hollowed, so as to adapt it to the ball of the foot; and as the heel of the boot must be thick enough to admit the peg or screw, it is desirable to lower that part of the wood of the skate corresponding to the heel, so as to permit the foot to retain that degree of horizontal position which it would otherwise lose by the height of the heel; for, the more of the foot that is in contact with the skate, the more firmly will the latter be attached. As the tread of the skate should correspond as nearly as possible with that of the foot, the wood of the skate should be of the same length as the boot or shoe. The irons should be of good steel, well secured in the wood, and they should pass beyond the screw or peg at the heel, nearly as far as the wood itself; but the bows of the iron should not project much beyond the wood in front; for if they did so, the whole foot, and more especially the hinder part, must be raised considerably from the ice when the front or bow of the skate is brought to bear upon it, and, as the skater depends upon this part for the power of his stroke, it is evident that that must be greatly diminished by the general distance of the foot from the ice. If the skate be too long, the ankle becomes fatigued; if too short, the support will be unsteady. The iron of the skate (which is usually about three quarters of an inch deep, and one quarter thick) is sometimes grooved at the bottom, and at

other times plain. The intention of the former kind, is to assist those whose light weight is insufficient to enable a plain skate to take a firm hold of the ice; but for persons of moderate weight, it is better to use skates with a plain edge, for a fluted or grooved edge cuts too easily into the ice, and is also liable to get clogged up with loose ice and snow. The bottom of the iron should be a little curved or convex from toe to heel; for if perfectly straight it would be capable of describing only a straight line; whereas the skater's progress is in almost every instance in a circular or at least a curved direction, because, in order to bring the edge to bear, the body must be inclined, and this inclination can only be preserved in circular motion: the curve of the iron should be part of a circle of two feet radius; as this form enables the skater to change the direction of the foot with facility.

It must be borne in mind, that the principal art in kating is to make proper use of the *outside edge* of the iron, for it is with this that the skater is enabled to execute the many figures which are sometimes seen. The first attempt of a learner is to stand firmly on his skates; then to walk with them; then to shuffle on in a sort of sliding gait; and then to form a circle inwards, that is, to turn the right foot towards the left and the left towards the right. But the "outside edge" has yet to be attained; and as this is peculiar, we will describe it somewhat more minutely than we have yet done, from a little work on skating published a few years ago. "The best method of getting to the 'outside edge,' is to form the circle inwards,—say with the right foot, and with considerable force; in the course of this, place the foot down in front of the right, and lean principally on the *outside* of the left heel. A little practice and confidence in his balance will enable the student to lift his *right* foot, and hang it behind, while he proceeds to cut outside with the left foot. Let him then stop, and begin the inward circle with the *left* foot, and slip down the outer edge of the right heel in the same way. He has now learned to balance himself, and can venture to strike at once out to the right, on the heel of the right foot, keeping the left suspended behind, with its toe closely pointed to the heel of the right. As he advances, the left must be brought past the inside of the right, with a slight jerk; this slight jerk produces an opposing balancing motion of the body: the right foot then quickly presses, first on the outside of its heel, and then on the inside of its toe, and by placing the left foot down before it, and striking outside to the left, giving at the same time a slight push with the inside of the right toe, he passes from right to left. Having learned this much, the skater will proceed to change from left to right and then from right to left again, without any trouble. To skate 'outside edge' properly, the toe of the suspended foot must be pointed close to the ice, behind the other, and kept there until this foot be required, when it must be brought sharply round to the change. The skater must keep himself erect, leaning most on the heel." This mode of skating being acquired, there is an endless variety of figures and modes of movement that may be produced; some of which are known by the names of the *Dutch travelling roll*, the *spread eagle*, the *Mercury figure*, the *backward outside edge*, the *circle*, the *figure of* 8, the *figure of* 3, *waltzing*, the *minuet*, the *pirouette*, the *quadrille, worming and screwing*, &c.—some of these names, it must be confessed, are rather fancifully applied.

Before concluding this paper we may remark, that as the exercise of skating can be enjoyed in this country only for a short period in the winter,—and sometimes not for many years together near our large towns,—an attempt has been made to supply a substitute, by which persons might rapidly glide over any level surface, though not with so much facility as upon ice. This contrivance, which we believe emanated from Mr Tyers, consists of the wood work of a common skate, or something nearly like it, but, instead of a steel support at the bottom, having a single row of little *wheels*, placed one behind another, the body of the skater being carried forward by the rolling of the wheels instead of the sliding of the iron. We have seen these skates used with much facility on a boarded floor; and were our roads smoother than they are, we think a source of healthful exercise might be found in their use; but with gravel roads, or an earthy surface, we fear they could not be extensively used.

ON PHOTOGENIC DRAWING. No. II.

The Daguerreotype.

In the *Saturday Magazine*, for April * last, we gave our readers a brief account of the discovery which had excited so much surprise and admiration on all sides, viz. the production of beautiful and correct drawings without the aid of the artist, but by the agency of light alone. We then gave some description of Mr. Fox Talbot's invention, as represented by him before the Royal Society, with an account of his method of preparing *photogenic paper*, and of *fixing* the design. We also alluded to contemporaneous discoveries of a similar nature which had been made by a Parisian artist of celebrity, M. Daguerre. Since that time M. Daguerre's method has been made public, and proves to be a somewhat difficult and delicate operation, but its results are exceedingly beautiful, and the drawings produced are carried to a degree of perfection, which far surpasses anything before accomplished in that way.

A report was made before the Chamber of Deputies by M. Arago to show the benefits which are likely to accrue to the arts through this discovery, and in this report the history of the invention was traced in the following manner. The property possessed by nitrate or chloride of silver, of becoming black by the action of light, was known to chemists at an early period, but does not seem to have been taken advantage of with regard to the production or re-production of drawings till the year 1802, when Mr. Wedgwood proposed a method of copying window-paintings by means of paper washed with chloride of silver. From that period, it became an amusement with many persons to perform experiments on the same principle. Taking some prepared paper, they placed between it and the sun, an engraving of which they wished to get a representation. This engraving was quickly reproduced on the paper beneath, but with all the lights and shadows *reversed*, for the dark parts of the engraving had intercepted the light, while the other portions had transmitted it freely. This amusement produced no beneficial results, for as soon as the engraving was removed, and the light had free passage to all parts of the prepared paper, the whole became in a very few minutes one black blank.

In the year 1814, a country gentleman, living near Chalons, named Niepce, commenced a course of experiments for obtaining the means to *fix* these beautiful but transient images, and made several remarkable discoveries. At length, in the year 1824, he learned by means of an optician at Paris, that Monsieur Daguerre was deeply engaged in photogenic studies, and especially in trying to fix the images of the camera obscura.

A partnership was entered into by these two gentle-

* See *Saturday Magazine*, Vol. XIV., p. 138.

men in the year 1829, for the further prosecution of the subject to their mutual advantage, and they continued their investigations until 1833, when Monsieur Niepce died, leaving a son to carry on the connexion. The act of partnership drawn up between M. Niepce and M. Daguerre, and which held good between his son and the latter gentleman, states, that M. Daguerre had discovered some entirely new methods, and that they had now the advantage of being able to reproduce images from sixty to eighty times more rapidly than before. At length, a complete and admirable process was discovered, chiefly by the labours of M. Daguerre. A visit was paid to the studio of the artist by Sir John Robison, Secretary to the Royal Society of Edinburgh, and a small party of English gentlemen with him, and they had thus an opportunity of observing that the pictures produced by M. Daguerre's process have no resemblance to anything previously exhibited in the way of photogenic drawing. Variety of colour alone is wanting to make them as perfect representations of a landscape, as those which we sometimes see reflected from a highly polished surface. Sir J. Robison describes the perfection and fidelity of the pictures to be such, that on examining them by microscopic power, details are discovered which are not perceptible to the naked eye in the original objects, but which, when searched for there by the aid of optical instruments, are found in perfect accordance: a crack in the plaster, a withered leaf lying on a projecting cornice, or an accumulation of dust in a hollow moulding of a distant building, when they exist in the original, are faithfully copied in these wonderful pictures. The subjects of most of the specimens exhibited by Daguerre to Sir J. Robison were views of streets, boulevards, and buildings, with some interiors and groups made up of plaster-casts, of which the latter gentleman thus speaks:—

It is difficult to express intelligibly a reason for the charm which is felt in beholding these pictures; but I think it must arise in some measure from finding that so much of the effect which we attribute to colour, is preserved in the picture, although it consists only in light and shade; these, however, are given with such accuracy, that in consequence of different materials reflecting light differently, it is easy to recognise those of which the different objects in the group are formed. A work in white marble is at once distinguished from one in plaster-of-Paris by the translucency of the edges of the one, and the opacity of the other. Among the views of buildings the following were remarkable: a set of three pictures of the same group of houses, one taken soon after sunrise, one at noon, and one in the evening; in these the change of aspect produced by the variations in the distribution of the light, was exemplified in a way which art could never attain to.

There is one remarkable circumstance attending these drawings, namely, that the figures of persons moving along the streets are not represented in the picture, nor is the marking of the pavement imperfect as if obscured by the intervention of their forms. This is accounted for by the consideration that passing objects do not remain long enough to make any perceptible impression, and that as they interfere only for a moment with the light reflected from the road they do not prevent an accurate representation from being gained.

The uses to which this admirable invention may be applied, and the purposes it may ultimately serve, are scarcely to be calculated, but it is evident that the architect and engineer may expect great advantages to result from it. The most correct representations may be made of buildings, machinery, &c., and these transferred to copper or to stone may be cheaply disseminated, and may serve for illustrations to books of moderate price. Anatomical and surgical drawings may be faithfully given: the traveller may get views of all the remarkable buildings and objects he meets with in his wanderings, and more than this, according to the philosophic Arago, antiquarians and scientific men may confidently hope for the acceleration of those sciences which do honour to the human mind. It would take "scores of years and legions of artists" to copy the millions and millions of hieroglyphics on the grand monuments of Egypt, but with the Daguerréotype a single individual would be able to accomplish the vast work, while these designs shall incomparably surpass in truth and fidelity the works of the ablest artists. The photographic delineations having been subjected, during their formation, to the rules of geometry, will also assist the estimation of the exact dimensions of buildings in their loftiest and most inaccessible parts. Until now, the rays of the moon, even when concentrated by the most powerful lens, or in the focus of the largest reflector, have been incapable of producing any perceptible physical effect. The plated discs, prepared by M. Daguerre, however, are found to receive impressions from the action of the lunar rays, and there is every reason to hope that photographic charts of the moon will ere long be obtained. By the aid of the Daguerréotype, the philosopher will be enabled henceforth to proceed on the principle of absolute intensities; he will compare lights by their effects, and if he find it desirable, the same tablet will present him with the impression of the dazzling beams of the sun, and with the pencillings of rays 300,000 times fainter than those of the moon—the rays of the stars.

Such are the opinions of Arago, respecting the discovery of M. Daguerre, and such no doubt are the opinions of most scientific persons who have had an opportunity of inspecting the beautiful delineations in question. The beauty of the results, however, has scarcely enabled many persons to overcome the feeling of disappointment attending the publication of M. Daguerre's secret. It had been hoped that, like the discoveries of Mr. Talbot described in a previous number, the elegance and simplicity of the operation would put it within the power of any individual to prepare the materials for these representations without such a complicated and delicate process as that M. Daguerre proves to be.

There is likewise another source of disappointment arising from the circumstance, that although (in consequence of an arrangement with the French government, of which we shall hereafter speak,) M. Daguerre has published his secret to the world, yet the benefit resulting from its publicity is confined to his own nation alone. An individual in this country is not therefore privileged to prepare the Daguerréotype for sale, since a patent has been obtained for the exclusive right of sale in England by Mr. Berry of Chancery Lane, with the full concurrence of M. Daguerre.

We reserve for a future number the particulars of the preparation of the Daguerréotype, which shall be given with minuteness, according to the information we have received on the subject.

NOTHING is so glorious in the eyes of mankind, and ornamental to human nature, setting aside the infinite advantages which arise from it, as a strong, steady, masculine piety; but enthusiasm and superstition are the weaknesses of human reason, that expose us to the scorn and derision of infidels, and sink us even below the beasts that perish.—ADDISON.

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